

The University of Chicago

THE ECONOMICS OF FLUCTUATING EXCHANGES

A PART OF A DISSERTATION SUBMITTED TO THE
FACULTY OF THE DIVISION OF THE SOCIAL SCIENCES
IN CANDIDACY FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY

DEPARTMENT OF ECONOMICS
1942

By
MICHAEL LINDSAY HOFFMAN

CHICAGO, ILLINOIS

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Introduction

As the mechanics of international monetary relationships have furnished a topic for discussion for almost as long as there has been a distinguishable field of economics it may seem paradoxical to suggest that the study of international monetary mechanics is a neglected branch of economic analysis, and yet there are important senses in which this latter is true. The particular part of the picture that has been poorly finished is the part that has to do with the rôle of exchange rates. The mechanics of international price relations have been endlessly discussed, but the exact manner in which those peculiar prices--the prices of one money in terms of others--are related to the rest of the price-income structure is frequently obscure. Among other reasons why this obscurity persists in the literature of economics, two appear to be of primary importance: (1) the almost exclusive attention devoted to a special system of international monetary relations under which exchange rates are reduced to relative insignificance as an active factor in the mechanism--that is, the international gold (or silver) standard;² (2) the tendency of writers in the field of international trade to copy (frequently incorrectly) their predecessors' theories of the mechanism of adjustment. Between 1819 and 1917³ no systematic analysis of the mechanism of adjustment under paper-standard conditions appeared. The most that one finds is an occasional discussion of the behavior of the exchanges in the event of an "over-issue" of paper currency. Not until recent years has it been fully realized that traditional

¹This paper is based on the author's unpublished doctoral dissertation bearing the same title. Frequent reference will be made to the larger work, which is available at the University of Chicago Libraries (M. L. Hoffman, "The Economics of Fluctuating Exchanges" [Unpublished Ph. D. dissertation, Department of Economics, University of Chicago, 1941]).

²For fuller discussion see Hoffman, *op. cit.*, pp. 3-5.

³The limits are set by Walter Hall, *A View of Our Late and of Our Future Currency* (London, 1819), and F. W. Taussig, "International Trade under Depreciated Paper: A Contribution to Theory," *Quarterly Journal of Economics*, XXXI (1917), 380-403.

gold-standard conditions are highly special, or that many aspects of international price relationships are seen clearly only in the light of a mechanism theory based on more general assumptions.

This neglect of certain aspects of mechanism theory would not be too serious if it were only a matter of rounding out the formal theory of international trade. The seriousness of the matter lies in the fact that many policy recommendations have been made on the basis of oversimplified notions about the mechanism of adjustment under paper-standard conditions. It cannot be over-emphasized that any statement about international monetary relations inevitably involves a theory of the mechanism, whether explicit or not, no matter how simple or how complex the statement may be. A statement based, consciously or unconsciously, on a "correct" theory may be of little use in the determination of policy because of the unreality of the conditions under which the theory is "correct," but a statement based on an incorrect theory is likely to be a poor guide to policy in any case. The importance of an analysis of the problems of fluctuating exchanges, therefore, is that it helps us to evaluate various policies whose effects depend on the behavior of prices, incomes, and other significant economic variables under fluctuating exchange conditions.

Taussig and His Critics

The starting point for any discussion of the modern theory of the mechanism under non-gold standard conditions must be Taussig's paper of 1917 in which he developed what later came to be called the "classical" theory.⁴ Taussig posits the existence of two countries, England, on the gold standard, and the United States, on a paper standard, between which transactions take place on trade account only.⁵ Into an equilibrium situation a series of long-term loans from England to the United States is introduced. Attention is then focused on the sequence of events in the United States, the paper-standard country.

The initial consequence of the loans is a fall in sterling exchange in New York and a fall in the value of dollar exchange in

⁴"International Trade under Depreciated Paper,"
op. cit.

⁵Ibid., pp. 381-82. In his later book he assumes that both countries are on paper standards, but this makes little difference as his analysis is mainly concerned with the sequence of events in the capital-importing country (International Trade [New York, 1927], p. 341).

London. At the same time, the gold premium in New York will fall relatively to the general price level. The consequent encouragement to United States imports and discouragement to United States exports will tend to encourage the former (measured in dollars) and decrease the latter until a new equilibrium is reached with exchange at a new level, dollar incomes the same, general prices lower, and a shift in the terms of trade in favor of the United States.⁶ Taussig was particularly interested in pointing out that the "real" effects of the disturbance under these conditions are identical with the effects to be expected under gold-standard conditions, though the direction of movement of money prices in the paper-standard country would be different.⁷ Real incomes in the United States are raised through a fall in money prices relative to money income. In the treatment of the same problem in the later book Taussig alters this theory only slightly. He assumes the existence of paper standards in both countries (an unimportant change), and he changes his statement that general prices would fall in the capital-importing country, concluding that only import prices would show a permanent (for the period of capital transfer) fall.⁸ This latter conclusion is supposed to follow from the assumption of a constant quantity of money, which Taussig interprets to mean constant money incomes, constant rates of remuneration of the productive agents, and thus constant money costs of production of domestic commodities and exports.⁹ Of course constancy in the quantity of money does not mean constant money incomes, and Taussig

⁶Hoffman, op. cit., pp. 10-11.

⁷"International Trade under Depreciated Paper," op. cit., pp. 397-98.

⁸International Trade, pp. 341, 348-51. In the book he also enlarges his discussion of the conditions attending the appearance of a bounty to exporters in the event of exchange depreciation. This discussion is important because it brings him face to face with the problem of the influence of the direction of expenditures upon the effect of any given disturbance on relative prices and rates of exchange--in this part of his discussion Taussig uses an issue of new paper money as his "disturbance." Taussig sees the essential point that the changes of money incomes associated with any such disturbance will have quite different effects depending on the kinds of things for which the increased incomes are spent, and the kinds of things on which expenditures are reduced by those with decreased incomes (ibid., pp. 388-89). He did not, however, have an adequate method of dealing with the effects of the direction of expenditures on the mechanism.

⁹Ibid., pp. 348-50.

fails to allow for the effect on prices of substitution in consumption among the various groups of goods--export, import, and domestic. There is no way of telling on the basis of the data given by Taussig what the effects of the disturbance on domestic prices will be, but his previous conclusion, which was simply that "the price level" of the capital-importing country would fall, is to be preferred to his later statement.¹⁰ The version given in his book is interesting primarily because it suggests the need for better tools of analysis for dealing with the complications of such adjustments.

Taussig's theory was designed to provide a theory of the mechanism under paper-standard conditions comparable to the traditional long-run analysis of the gold standard mechanism.¹¹ A number of writers have attacked his conclusions as being either invalid on the basis of his assumptions or "unrealistic" or both. None of these attacks has succeeded in showing that Taussig's theory is incorrect or meaningless as a simplified, formal analysis of the long-run adjustment problem. The most important criticism has been that Taussig neglected short-term capital movements.¹² But it can be shown that from whatever angle this criticism is brought to bear it misses the mark because the introduction of more detailed analysis of the foreign exchange market would have complicated his theory but would not have altered it in important particulars.¹³ If short-term capital movements are really short-term their presence or absence does not affect the operation of the long-run factors in which Taussig is interested. Taussig was not ignorant of short-term capital movements or of their effects; he was simply abstracting from them.¹⁴

¹⁰Hoffman, *op. cit.*, pp. 11-17. ¹¹*Ibid.*, p. 45.

¹²Carl Iversen, Aspects of the Theory of International Capital Movements (London, 1935); P. B. Whale, "The Theory of International Trade in the Absence of an International Standard," *Economica*, N. S. III (1936), 28; J. C. Gilbert, "The Present Position of the Theory of International Trade," *Review of Economic Studies*, III (1935), 28, among others. Whale even argues that Taussig's problem is insoluble in the light of his own assumptions because of the neglect of short-term capital movements ("The Theory of International Trade . . .," *op. cit.*, p. 28).

¹³Hoffman, *op. cit.*, chap. iii, is a detailed analysis of these criticisms.

¹⁴International Trade, p. 226; see also "International Trade under Depreciated Paper," *op. cit.*, p. 381, where he says that his interest is "not in the foreign exchanges, but in the

Taussig's theory also has been criticized for its failure to recognize the possibility that the initial exchange rate-price adjustment may call for further movements of exchange rates or prices or both which are not corrective, but, on the contrary, self-aggravating.¹⁵ There are several versions of this criticism roughly divisible into two general groups: (1) those which contend that commodity movements may be disequilibrating; (2) those which contend that certain methods of financing trade make disequilibrating movements of exchange rates inevitable.¹⁶ Each of these types of argument needs to be judged partly as a criticism of Taussig and partly on its own merits.

The first argument maintains that the "elasticity of demand" for a country's exports may be "less than one," and that, if this is the case, a fall in the foreign value of that country's currency may not stimulate its exports enough to increase their total value, and may actually decrease the total amount received by exporters (in terms of foreign currencies). This, it is held, would result in further depreciation of the given country's currency, not a correction of the fall, as envisaged by Taussig. It is quite true that Taussig did not deal with this possibility in his theory, and, to the extent that it is a real possibility, his conclusions are less widely applicable than he thought. But those who have raised the problem of disequilibrating commodity movements have failed to show that such movements are likely to be met with in actual situations and have failed to state correctly the conditions under which such movements would occur.¹⁷

The major error of these writers is due to the fact that they have used the term "elasticity of demand" without investigating the possible meanings of this term in mechanism theory. If, as is typically the case, the "elasticity" referred to is the

eventual outcome in the barter of commodities for commodities between nations, and so in the gains ultimately secured for international trade." I am not maintaining, of course, that Taussig would have denied the importance of a detailed analysis of the effects of short-term capital movements on the mechanism.

¹⁵Iversen, *op. cit.*, pp. 317-18, among others, raises this point. See Hoffman, *op. cit.*, pp. 27-29.

¹⁶Both types of argument are given by most writers touching on the question. See C. F. Bickerdike, "The Instability of the Foreign Exchanges," *Economic Journal*, XXX (1920), 118-22; Whale, *International Trade* (London, 1932), pp. 88-90; J. Robinson, *Essays in the Theory of Employment* (London, 1937), p. 197.

¹⁷Hoffman, *op. cit.*, pp. 83-95, for an extended analysis.

elasticity of a Marshallian, two-dimensional, domestic trade demand curve no significant statement about the effect of exchange depreciation on the value or quantity of exports can be made in terms of it. This type of elasticity ignores the effect of changes in the value of money and of changes in money incomes, both of which are too important to neglect in problems of international monetary adjustment.¹⁸ If the elasticity referred to is the elasticity of a reciprocal trade curve, on the other hand, it is inapplicable because of the impossibility of expressing in terms of these curves changes which are not changes in the "real" demand and "real" cost situation.¹⁹ In either of the usual senses of the term the statement that the "elasticity of demand" is less than unity is not a meaningful proposition in mechanism theory. The situation that these writers are attempting to describe, however, is clear. The true nature of the problem may be seen in terms of the more appropriate concepts of substitution and income elasticities, which can be applied to international trade problems, and which are free of the objections made to the older concepts.²⁰ In order to build a framework that would define a situation in which the direction of movement of commodities in international trade was disequilibrating it would be necessary to assume that when import prices fell the total amount spent on that category of goods decreased, as a result of special consumer demand conditions, when both the effect of consumers turning away from other commodities and the income effect were considered.²¹ Unless the income effect is negative, which would mean that a decrease in the amount of the given commodities purchased would follow an increase in money incomes, there will always be some tendency for a fall in the exchange value of the currency to increase exports, and it would be necessary to show that substitution of the given country's exports for other goods in the world's consumption is so difficult that a low substitution elasticity more than offsets

¹⁸J. Viner, Studies in the Theory of International Trade (New York, 1937), pp. 582-93.

¹⁹Hoffman, op. cit., pp. 89-93.

²⁰The demonstration of the applicability of the concepts of elasticity of substitution and the income elasticity of demand to problems involving large groups of individuals and large numbers of commodities is too lengthy to be given here. See ibid., chap. vi.

²¹Ibid., pp. 94-95.

the income effect of the price changes. The problem appears to be quite unreal.

The second supposed source of self-aggravating exchange movements is found in the foreign exchange market itself. Several writers have argued, in effect, that if all of a country's assets are in its own currency while its liabilities are entirely in foreign currencies no amount of depreciation would bring about a temporary equilibrium in the foreign exchange market.²² This dilemma, however, is purely artificial. The fact that nobody in London has dollar assets to convert into pounds when the value of the pound falls is not sufficient ground for assuming that nobody anywhere will want to convert dollars into pounds when the latter become cheaper.²³ In other words, the whole difficulty arises only when it is assumed that because the English couldn't buy sterling the Americans wouldn't, which is absurd.²⁴ It is difficult, in any event, to imagine any trading relations under the circumstances envisaged by Graham and others. As far as Taussig's theory is concerned, the methods of financing assumed in his examples are of the type which, by general agreement, give rise to no problem of self-aggravating movements of exchange rates. Whale, it is true, maintains that Taussig's assumption about the demand for sterling precludes him from solving the problem of exchange market equilibrium.²⁵ But Whale's assertion is based on a mistaken reading of Taussig's assumption that there is nothing in the disturbance "to change the conditions of demand" for sterling.²⁶ Whale interprets this to mean that the same number of units of sterling

²²Whale, International Trade, p. 91; Iversen, op. cit., p. 319. Graham's presentation, which is perhaps the best known, makes use of a slightly different example, but the problem dealt with is essentially the same (F. D. Graham, "Self-limiting and Self-inflamatory Movements in Exchange Rates: Germany," Quarterly Journal of Economics, XLIII [1929], 223-24).

²³Among other things, the argument assumes that no Americans would pay off sterling debts when the pound falls. See Hoffman, op. cit., p. 80.

²⁴Ibid., p. 81. Graham also gets into difficulty because his distinction between "necessary" and "provisional" effects of exchange rate variations breaks down when the existence of forward contracts is admitted, as it is by Graham. Cf. Graham, "Self-limiting and Self-inflamatory Movements," op. cit., pp. 223-26; Hoffman, op. cit., pp. 76-78.

²⁵Whale, "International Trade in the Absence of an International Standard," op. cit., p. 28.

²⁶Taussig, "International Trade under Depreciated Paper," op. cit., p. 383.

would be bought at any exchange rate, while Taussig meant, as can be seen from any of his examples, that the same number of dollars would be offered until commodity price changes had time to take effect. It is also clear that he assumed that the British paid for their imports in sterling.²⁷

Short-term Capital Movements

One matter which has received considerable attention from modern writers is the rôle of short-term capital movements in the mechanism of adjustment. One of the important issues raised in this discussion is whether or not, in the absence of an international standard, there is a "transfer of purchasing power" in the course of a disturbance (such as a long-term loan) and consequent adjustments anything like the transfer of money that takes place under the gold standard.²⁸ The question is of little importance for the case of completely unregulated exchange conditions, because of the probability that short-term capital movements will be predominantly speculative in nature under those conditions, but it is of some importance for a clear understanding of the problems of regulated exchanges and for the formal completeness of mechanism theory. The complications which may be introduced in an analysis of this problem are innumerable, but the main conclusions which emerge may be set down fairly simply.²⁹

In the first place, there is nothing which exactly corresponds to the monetary transfer which occurs as part of the adjustment to, say, the floating and utilization of the proceeds of an international long-term loan.³⁰ The actual phenomena inaccurately lumped together under the heading of "a transfer of purchasing power" seem to be divisible into two types of changes:

²⁷Taussig, International Trade, pp. 358-59, 344; Hoffman, op. cit., p. 31.

²⁸The quoted phrase is Kindleberger's (International Short Term Capital Movements [New York, 1937], p. 53).

²⁹For a fuller discussion of the various cases that have been dealt with in the literature see Hoffman, op. cit., chap. iv.

³⁰There is, of course, a transfer of ownership of assets, including money, from individuals in the lending country to individuals in the borrowing country but this is evidently not the kind of "transfer" which is a problem for mechanism theory. The term, as commonly used, implies a transfer of spendable funds between monetary systems analogous to the transfer of goods which is ultimately brought about through the operation of the adjustment mechanism.

(1) relative changes in the quantities of money in the countries concerned; (2) changes, for either country, in the circular velocity of money brought about by changes in the size of inactive balances, or by changes in the distribution of balances between the financial and industrial circulations.³¹ As to the second type, there is no presumption that it will be in the "right" direction, unless one assumes that changes in foreign-owned demand deposits (which might possibly be classified as "inactive") are likely to occur in response to an equilibrating short-term capital movement to a large enough extent to affect seriously the circular velocity of money in the country whose short-term foreign liabilities are thus increased. This assumption does not appear to be realistic, as the size of such balances is determined primarily by banks' and corporations' requirements for working balances, and such balances are not likely to vary appreciably from the minimum requirement for working purposes in response to this kind of a capital movement. Equilibrating capital movements are likely to involve other forms of assets.³² Changes in the money supply will be in an equilibrating direction if they result from the expansion of deposits on the basis of new foreign short-term assets, and the contraction of deposits following a decline in the volume of such assets. These changes in the money supplies may be equal to, greater than, or less than the amount of the capital movement, and we cannot be sure of their effects to anything like the extent that we can be sure of the primary effect of gold movements, which, except in one rather unusual case, always result in a primary change in the money supply of the same size as the gold movement.³³

³¹Hoffman, op. cit., p. 69.

³²Ibid., p. 64. The above proposition does not apply to the balances of banks in exchange standard countries held in banks of the reserve country. It might also be added that changes in inactive balances do frequently occur in response to short-term capital movements of a "disequilibrating" character--a disequilibrating short-term capital movement being defined, in this connection, as a movement in the same direction as that taken by any gold and/or long-term capital movements that may be in progress.

³³The only case, for instance, in which a gold import (not including earmarked or borrowed gold) will not increase the money supply under gold-standard conditions is that in which a bank is the importer and reduces its own foreign assets (or increases its liabilities to foreigners) by the amount of its own gold imports (ibid., pp. 53-54, n. 19). This is a narrower restriction than that usually imposed. Cf. Kindleberger, op. cit., pp. 25-26.

There appears to be no presumption that the effects of short-term capital movements on the money supplies will be in an equilibrating direction. It is important not to exaggerate the symmetry between the mechanism under the gold standard and the mechanism under inconvertible currency conditions. Terms like "transfer of purchasing power" are misleading because they obscure the processes that are actually involved in adjustment sequences.

Exchange Rates and Monetary Stability

The most important debate about monetary policy in which the theory of the mechanism is directly involved is the debate between those who believe that a purely national currency would be better than an international currency and those who do not believe this. It frequently has been maintained by those who advocate a purely national currency that a country has to choose between "external stability" and "internal stability," somehow defined, and that internal stability is attainable only at the sacrifice of exchange stability (generally assumed to be synonymous with external stability). Such a statement of the problem is, to say the least, question-begging. The crucial question is whether, or in what sense and under what circumstances, a country has a choice between a monetary system which is subject to disturbances originating "outside" that country's monetary area and a monetary system which is not subject, or less subject, to such disturbances. An examination of the literature on the question reveals that, for the most part, the advocates of monetary nationalism have simply assumed that a "free" exchange rate makes a country independent of outside influences, and thus able to pursue its own ends untroubled by the level of world prices or other international factors.³⁴ And although very few writers have gone so far as to advocate completely uncontrolled exchanges, the view of the rôle of the exchange rate which underlies their advocacy of various degrees of exchange freedom is derived from a theory of the mechanism under free exchange conditions proper.

³⁴See Hoffman, *op. cit.*, chap. vii. A free exchange rate exists when there is nothing that has: (1) a fixed price in terms of the monetary unit of the given country and the monetary unit of the rest of the world, and (2) a market where it may be bought and sold at this fixed price. The existence of any official controls involves a departure from strictly free exchange conditions.

The exact nature of the free exchange mechanism which underlies most of the advocacy of purely national currencies is more often obscure than clear. Generally it must be deduced from statements about the contrast between gold and paper standard conditions. A few writers have been somewhat more explicit. Haberler, in an illustration, provides a clear example of the type of mechanism that is usually assumed, though Haberler himself is not generally regarded as a "monetary nationalist."³⁵ Haberler pictures two cylinders with water in them.³⁶ Movements of the water level represent movements of the price levels in the two countries for which the cylinders stand. The gold-standard case is described by the case in which a pipe connects the two cylinders below the water line. In the inconvertible paper case there is no connection between the cylinders. Price changes then "would be reflected in relative changes in the two water levels, representing a shift in the exchange rate."³⁷ It is clear that there is no relation between the monetary systems of the two countries in this latter case--they are "independent" of each other.

A similar theory of the mechanism is implied in such statements as the following: ". . . a country which is not on the gold standard will therefore be free to concentrate on its internal monetary policy in order to preserve a high level of employment, and can leave the exchange rate with other countries to find that level at which the payments and receipts in its Balance of Payments are equal."³⁸ Some writers, like Mr. Keynes, have concentrated on a particular kind of "independence"--in most cases, independence of interest rates--but the underlying principle is the same, namely, that exchange rate "freedom" insures monetary independence.³⁹ And in spite of the fact that Mr. Harrod has

³⁵It should be noted that gold standard advocates have been just as guilty as their opponents of misunderstanding the nature of relations among monetary systems in the absence of an international standard.

³⁶G. v. Haberler, The Theory of International Trade (London, 1936), pp. 41-42.

³⁷Ibid., p. 42.

³⁸J. E. Meade, Economic Analysis and Policy (2d ed.; London, 1937), p. 325. See also E. F. M. Durbin, The Problem of Credit Policy (New York, 1935), pp. 206-213; A. D. Gayer, Monetary Policy and Economic Stabilization (New York, 1935), pp. 155-56.

³⁹J. M. Keynes, A Treatise on Money (London, 1931), II, 319-32, 336, 338; The General Theory of Employment, Interest, and Money (New York, 1936), pp. 270, 349.

gone farther than any of the other monetary nationalists in pointing out limits to the power of a purely national monetary authority imposed by the repercussions of monetary policy on the balance of payments (and vice versa) he continues to base his policy recommendations on the premise that the exchange rate is a purely passive factor.⁴⁰

A number of writers have felt that there was some weak link in the chain of argument built to support monetary nationalism, and there exists a little known, but important, literature in which direct attacks on the central problem of mechanism theory have been made. Among others, J. H. Jones has presented an argument to show that interest rates are not independent under free exchange conditions, while C. R. Noyes and L. Currie have argued that the existence of capital movements would prevent any one country from following a completely independent monetary policy.⁴¹ While there are some flaws in these arguments, each of them has focused attention upon one or more ways in which price and income levels in different countries are related even under free exchange conditions.⁴²

Professor Hayek, perhaps the outstanding opponent of monetary nationalism, has seen more clearly than anyone else the fact (emphasized above) that even though the case against monetary nationalism in practice may be made quite strong on "practical"

⁴⁰R. F. Harrod, International Economics (Cambridge, 1933), chap. vii. Harrod's assertion that when a force begins to operate which would, under the gold standard, depress national income, the monetary authorities, under a free exchange standard, can take steps to maintain incomes at their old level is qualified by the provision that "there is no change in the relevant special circumstances" (*ibid.*, p. 141). But a careful examination of his "relevant special circumstances" reveals that they include capital movements, changes in the proportion of incomes spent on international goods, changes in rates of remuneration of the factors of production out of proportion to changes in "efficiency," and numerous other occurrences almost all of which (let alone any one) are likely to be present in connection with any significant international disturbance. Harrod's method of disposing of the "relevant special circumstances" involves him in contradictions and even absurdities. See Hoffman, *op. cit.*, pp. 128-39.

⁴¹Jones, "Exchange Stability vs. Internal Price Stability," Journal of the Royal Statistical Society, XCVII (1934), 277-97; Noyes, "Stable Prices vs. Stable Exchanges," Econometrica, II (1935), 129-46; Currie, "Domestic Stability and the Mechanism of Trade Adjustment to International Capital Movements," Explorations in Economics (New York, 1936), pp. 46-56.

⁴²Hoffman, *op. cit.*, pp. 152-73.

grounds, the crux of the matter is to be found in the theory of the mechanism which underlies the belief that exchange freedom insures freedom from international disturbances.⁴³ The particular case which he uses to demonstrate the fact that monetary systems are not independent under free exchange conditions is one in which the initial disturbance is a disproportionate technological advance in one of a group of trading countries.⁴⁴ He shows that the effect on the advancing country will be such that the monetary authority will have either to force a reduction in the prices of domestic goods or allow a rise in all prices.⁴⁵ Hayek's case, unfortunately, is faulty in certain details, but he shows clearly how the effects of substitution in consumption necessarily "spread" a price disturbance from international to domestic goods and vice versa.⁴⁶ Furthermore he presents an anti-independence argument the applicability of which is not confined to cases in which capital movements are the disturbing factor.

It would seem that the only way to examine thoroughly into the theory of monetary independence is to examine typical cases set up in such a way that the essential points at issue are most clearly brought out. Let two countries, D and F (the world except for D), be on "independent" monetary standards--that is, standards such that there is nothing which has a fixed price and is bought and sold in unlimited amounts in terms of both currencies--and let the exchange rate between the two be neither fixed nor controlled. Assume that an injection of new money takes place in country D in such a manner that an initial increase of equal proportions occurs in the incomes of all individuals in that country. This could take the form of tax refunds, bonus payments, or relief. The assumption that it applies equally to all individuals is not necessary. It is the most convenient assumption to make in order to avoid detailed statements about the distribution. The effects would differ with each different distribution.

⁴³F. A. v. Hayek, Monetary Nationalism and International Stability (London, 1939), p. 62.

⁴⁴Ibid., pp. 37-46.

⁴⁵Ibid., p. 42.

⁴⁶Hoffman, op. cit., pp. 176-78. Hayek's difficulty arises from the fact that he does not distinguish clearly between a cost-lowering and a product-changing technological change, and though he starts with a cost-reducing change some of his argument is valid only in the case of the product-changing type of technological change (ibid., p. 176, n. 63).

Case I.--The first case to be examined for an open economy is the limiting case of full employment. The income elasticities of demand for domestic, import, and export goods are all considered to be equal to one. Commodities are considered to be the only items in the international accounts of either D or F, and commodity stocks are assumed constant (or non-existent). A condition of equilibrium of all prices with respect to the existing distribution of incomes is also assumed.

The initial increase in incomes in D, under these conditions, will result in a proportional increase in the flow of money directed against each of the three classifications of goods. The prices of domestic goods will rise. The exchange rate will rise because the money-demand for imports rises, while there is no reason to expect that the flow of F-money spent on D's exports will change at first.⁴⁷ If the elasticity of substitution in F between D's export goods and all other goods is much greater than one, the flow of F money against D's exports would fall, if anything, until the exchange rate had risen in proportion to the income increases. If the rate did not at once rise, goods of the export class formerly sent to F will be sold on the D market. They could be more profitably sold on this market than abroad, due to the increased money incomes in D, as long as the exchange rate does not rise sufficiently to equalize the attraction of the two markets. But under the full employment assumptions, this necessarily reduces the quantity of D export goods available in F, raises their prices in F, and, when other goods are readily substitutable, results in a reduction of total F money spent for D goods. This type of adjustment will provide an almost immediate corrective to any lag in the exchange rate.

The result, as far as this particular disturbance is concerned, would be a rise in domestic, import, and export prices roughly in proportion to the increase in the money supply, and no change in the amounts of imports or exports. This over-simplified result implies a smooth adjustment of prices, including wage rates. Frictions of any kind will involve a redistribution of incomes in the next "period," and this necessarily involves further adjustments of prices, and the like.⁴⁸ Since attention is here directed

⁴⁷The term "money-demand" will be used to designate the total money payments directed against a given category of goods in a given period. It is a one-dimensional concept.

⁴⁸Cf. Durbin, op. cit., pp. 112-20, especially pp. 119-20.

to the unreality of the case as it is, there is no necessity for elaborating further detailed implications of conditions which only make it less significant. Case one, as can readily be seen, corresponds to a case of true independence. The exchange rate exerts no independent effect whatever on the behavior of prices. The above is also, of course, the case where the purchasing power parity theory holds without modification, and is the only case in which it so holds.⁴⁹ It is the only case in which it can be claimed that free exchanges allow monetary independence. This point will be argued by introducing various simple modifications in assumptions, and examining the working of the mechanism under the same kind of disturbance.

Case IA.--In this case, which is minor because it involves only possibilities, and not strong presumptions, all conditions in D are assumed to remain the same, but an elasticity of substitution of less than unity is assumed in F between D goods and all other goods. It seems likely that this modification will destroy the symmetry of price movements in D, and thus D's independence.

For instance, if anything, such as an autonomous movement of short-term bank balances from F to D (this too, it should be remarked, alters case I) delays the rise of the price of F exchange in D, the total F money value of its imports of D's goods will rise as the D market draws a larger share of the total output and the F market a smaller share. This will occur unless the income elasticity of demand for D goods in F is very large. It happens because a relative rise in the F prices of D goods, as fewer are available to the F market, will result in substitution of other goods, but substitution less than in proportion to the higher F prices. Instead of acting as a corrective to the exchange rate's lag, this prolongs a lower rate. At this lower rate, of course, the total F money value of any given D money demand for money incomes will result in an increase in both the D and F money demand for F's exports. There will thus be some rise in the F prices of

⁴⁹Noyes, "Stable Prices vs. Stable Exchanges," *op. cit.*, pp. 131-32; Viner, *op. cit.*, p. 384. It should be noted that Professor Cassel himself at least occasionally recognized explicitly that the purchasing power parity doctrine was true only when "the rise in prices in the countries concerned has affected all commodities in a like degree" (G. Cassel, Money and Foreign Exchange after 1914 [New York, 1923], p. 154). Though he does not mention incomes, it is clear that he is limiting the case to the above, perhaps without fully appreciating the restrictions so involved.

D's import goods as well as a rise in their D prices.⁵⁰ It is possible that if there were full employment in F, and if new monetary disturbances were not induced by these price shifts, or by the capital movements--that is, if these were quickly reversed--the final effect upon prices and the exchange rate in D would be the same as in Case I.⁵¹ The only difference would be that the initial lag in the exchange rate movement would have caused part of the adjustment to be effected in F, and the low substitution elasticities in F would have resulted in the burden of the adjustment being thrown upon incomes. Eventually the D-F rate of exchange would turn against D, F prices of the international goods would fall again, and their D prices rise.

But the connection between cause and effect becomes very tenuous. The repercussions set up in F are very likely to react further on the price-income system, and on D. One such likely reaction would result from the initial tendency in F to shift from goods which are D imports (F exports) to F domestic goods, releasing D import goods for D, and causing readjustments in the income distribution in F (and eventually also in D). This case cannot be called one of independence except in the accidental circumstance that the original behavior of the exchange rate is such as to cause no effect on the F money demand for D's export goods.⁵²

⁵⁰The small elasticity of substitution could not persist, of course. Even if it should, eventually the effect on incomes would be great enough to bring an adjustment in a corrective direction. As noted above some writers have described cases of "inelastic demand" in terms that lead one to believe the exchange rate would never stop moving in one direction. In such accounts no adequate demand concepts are used, and the rôle of income elasticities is completely neglected. See above, pp. 5-7.

⁵¹Professor Hayek suggests that to follow through his cases on the assumption that a rise in price will result in a fall in the total amount spent (Hayek uses the vague terminology of price elasticities of demand) "would unduly lengthen the argument without affecting the conclusion" (Hayek, *op. cit.*, p. 38, n. 1). He is quite right that it would not affect the conclusion in which he is interested, which is that independence would not exist, but it might affect the nature of the adjustment.

⁵²Case IA appears to correspond to Whale's "alternative case" (*International Trade*, pp. 92-95). His analysis is very hard to follow because of lack of precision. He describes a case where he is "abandoning another of the assumptions on which the previous analysis has been based, the assumption, namely, that in the case of paper currencies the internal price-and-income structure (apart from the price of imported goods) is independent of the international position." The impossibility of making sense out of this statement has been commented on above. The case, then, is charac-

Case II.--The next case to be examined is that characterized by the existence of general involuntary unemployment in the country D which experiences the increased supply of money. The simplest case is that in which the distribution of unemployment between industries is even.⁵³ In a closed economy the results of the increased supply of money would appear partly in the form of increased employment and output, and partly in rising prices. Prices would presumably rise less rapidly than in the case where voluntary unemployment was absent, and much less rapidly than in the case where even involuntary unemployment was absent.

In the present case of an open economy under free exchanges, domestic prices would rise less than in case one as a result of the initial impact of the new money expenditures. (Income elasticities are still assumed to be equal to unity, and all other assumptions are as before.) The initial increase in the demand for F money on the part of import purchasers would be the same as before. If the price of F's currency should rise as in the first case, there will be an increase in the flow of export goods to the F market, resulting, when the elasticity of substitution between these goods and all others in that market is greater than one, in lower F prices and a greater total amount of F money spent on such goods. This will naturally tend to prevent the exchange rate rising as far as it otherwise would. This differs from case one, it should be noted, in that under the assumption of unemployment, it is possible for both the D market and the F market to be supplied with larger goods flows, whereas under the previous assumption the two markets had to compete for a nearly unchanged volume of goods. Unless there is unemployment in F, as well as in D, and its amount and distribution, and the F conditions of substitution in consumption of D export goods and goods which D imports are such as to make it possible for a volume of F produced D import goods equal in value to the net increase in terms of F money of the D money-demand for import goods to be forthcoming at unchanged F prices, these prices must rise. If

terized by depreciation of the currency (the question of how this is brought about is not touched upon; so of course nothing is said about the direct monetary effects thereof), and a demand for imports which is "inelastic." His country, of course, corresponds to our country F above, and suffers a depreciation instead of an appreciation.

⁵³ Keynes, General Theory, p. 300.

the F demand conditions are such that D exports are readily substitutable for F exports, or if both types of goods are subject to very elastic income demand conditions, it is possible that the F prices would not rise. Similarly, if the amount or distribution of unemployment were such that large expansion of output at existing price levels was possible there might be no rise in prices. Plainly both these are special cases. The latter seems almost impossible of realization over the entire range of products likely to be included in the F export list. About the former nothing very intelligent can be said on an a priori basis. In most kinds of cases, therefore, the failure of the exchange rates to rise in proportion to the increase of flow of D money directed to D's imports would result in a rise in F prices of those goods as well as in their D prices. (This is an unfavorable movement in D's commodity terms of trade.) The D prices of D import goods will therefore rise by more than the amount of the exchange rate rise, and more than in proportion to the rise in export and domestic prices. There will be a shift in consumption away from import goods in D and to goods of the export class, and domestic goods, to an extent depending on elasticities of substitution between these relevant categories. Both domestic and export goods, therefore, will be subject to greater price increases and/or changes in output than could be accounted for by the change in money incomes alone. How much greater will depend on the strength of the tendency toward substitution, and on the changes in income elasticities of demand, following the shifts in relative price levels.⁵⁴ The greater the elasticity of substitution between import goods and all other goods in D, the less will import prices be allowed to rise relatively to other prices, and the greater will be the effect of the monetary expansion on domestic and export prices. In the event of a large substitution elasticity, the unfavorable movement of the terms of trade would be held to a minimum, and the exchange rate would rise relatively more than in the case of a small elasticity of substitution between these categories. This latter follows from the fact that export prices in D would be held relatively high, and the F value of D's exports would therefore contract (or expand less than supposed in the "initial" adjustment).

⁵⁴ Income elasticities of demand cannot be assumed to be constant (Hoffman, op. cit., p. 112, n. 27.

There exists in this case, therefore, a very strong presumption against the D adjustment being anything like "independent" under conditions of perfectly free exchanges. As it is with respect to the use of monetary manipulation as a cure for unemployment that the independence supposedly provided by free exchanges has received the most support, this case is much more important than the preceding ones.

By means of similar reasoning it can be shown that the removal of the assumption of unitary income elasticities of demand in D for the three classes of goods, or the presence of any "rigid" items in the balance of payments of either country (or expressed in either currency) will destroy the independence of D's monetary system. We may say that the term "monetary independence" describes a situation in which a monetary disturbance in an open economy works itself out in the same manner as it would in the same economy if that economy were shut off from the rest of the world. We may conclude:

1. Under conditions of full employment, and with substitution and income elasticities such that no disproportionality of price movements tends to occur following a monetary disturbance, a country may be independent of other monetary systems. This is true whether the initiating disturbance is within the country or not.

2. If there are any factors which result in an initial disproportionality of price movements the foreign exchange rate exerts an active pressure on the internal price-income structure, and the monetary system cannot be said to be independent. This is true also whether the initiating disturbance is within or without the country in question.

3. Circumstances which destroy independence include, but not by way of limitation, the existence of unemployed resources, unequal income inelasticities of demand for international and domestic goods respectively, and the existence of items in the balance of payments which are fixed in terms of any monetary unit per given time period.⁵⁵

Problems of Controlled and Uncontrolled Exchanges

Although it is evident that the adoption of free exchange

⁵⁵In fact, the existence of items of payment anywhere which are fixed in terms of any monetary unit would destroy national monetary independence.

rates would not isolate a country completely from international monetary disturbances it cannot be definitely asserted on the basis of formal theoretical analysis that a country with free exchanges would necessarily have a less "stable" monetary system, in any sense, than a country with a fixed exchange system.⁵⁶ This is one of those questions of "more or less" on which no inflexible statement may be made. Several considerations, however, support the conclusions: (1) that some kinds of disturbances would be very much more of a problem under free exchange conditions than under gold or fixed exchange standard conditions; and (2) that the possibilities of maintaining any sort of general stability (for example, of the price level) are much less than has frequently been supposed.

In the first place, it is clear from our previous analysis of the operation of the mechanism that the effect of the "exchange rate pressure" on the price-income system will be governed in part by conditions of substitution in consumption.⁵⁷ When a change in relative prices follows a disturbance of any kind, the greater the substitutibility of export, import, and domestic goods for each other, taken separately (one against the other two), and also in pairs, the more readily will relative price changes be damped down. On the other hand, the more consumption shifts in response to relative price changes the greater will be the effect on domestic prices of changes in the rate of exchange, and the greater will be the effect on the general price level. If substitutibility is poor, on the other hand, relative price changes will be greater, and the transfer of pressure less. It can also be shown that groups of commodities for which income elasticities are large will be subject to greater relative price movement than groups for which income elasticities are small.⁵⁸ These conclusions warn against accepting the argument that general price level variations would be small under free exchange conditions while accepting at the same time the argument that relative price-level variations and variations in the exchange rate would not be serious. If the

⁵⁶ Any criterion of stability may be adopted; for instance, stability of some general price level. It hardly needs to be mentioned that comparison is possible only if similar aims of monetary policy are supposed to exist under the various alternative systems being compared.

⁵⁷ The term "exchange rate pressure" is an attempt to sum up the rather complicated influences of the rate of exchange on prices and incomes described in more detail above, pp. 13-19.

⁵⁸ Hoffman, op. cit., pp. 207-210.

exchange rate is to do any considerable amount of "adjusting," the case for a more stable general price level might just as well be used as a case for less stable relative price levels. Monetary management has not yet progressed to the point where a nice compensation for pronounced movements in any important groups of prices is possible. The only non-totalitarian countries which have shown any success in pursuing price-level stability--for example, Norway, Sweden, Australia--are countries in which exchange rates have been rather rigidly pegged during the period in which price-level stability was attained.⁵⁹ These points frequently are overlooked.

Evidently, the possibility of approaching any sort of stability by internal monetary controls under free exchange conditions is remote unless one assumes that exchange rates would not, in fact, vary a great deal in the absence of control. Observers of the foreign exchange markets and economists, with very few exceptions, agree that perfectly free exchanges would be likely to fluctuate widely and frequently.⁶⁰ There appear to be two fundamental considerations supporting this view.⁶¹

First is the fact that an important part of international trade is in "factor-goods"--goods that are affected primarily by investment rather than by consumption decisions. Goods of this type are typically subject to greater changes in money-demand than are goods the demand for which is directly dependent on consumers' tastes. Moreover, changes in investment outlay are likely to be greater in both frequency and degree when the prices of investment goods are subject to frequent and pronounced changes. There is a

⁵⁹Ibid., chap. xii. See also, among others, B. Thomas, Monetary Policy and Crisis (London, 1936), pp. 195-205, 199, 204; H. L. Harris, Australian National Interests and National Policy (Melbourne, 1938), pp. 61, 108-109.

⁶⁰The only economists who have attempted to argue at any length that exchange rates would not vary much under free exchange conditions are Professors Graham and Whittlesey (F. D. Graham and Charles Whittlesey, "Fluctuating Exchange Rates, Foreign Trade, and the Price Level," American Economic Review, XXIV [1934], 401-416). For reasons of space it is impossible to review their arguments here, but I have done so elsewhere (Hoffman, op. cit., pp. 218-28). I find it rather poorly grounded in the "facts" of the foreign exchange market and completely unconvincing.

⁶¹It is impossible to do much more here than make a few bald assertions on these points. The argument is of a type that can hardly be condensed, and the interested reader is referred to ibid., chap. x.

well-known tendency for changes in investment outlay to be self-aggravating, within limits, of course.⁶² Any given variation in exchange rates is likely, therefore, to cause greater changes in money demand for factor-goods than for consumption goods, and, conversely, changes in the money demand for factor-goods are likely to be a more important cause of variation in exchange rates than are changes in demand for consumption goods. In Mr. Hicks' terminology, the existence of a free exchange rate contributes to the elasticity of price expectations with respect to both goods and securities and particularly with respect to factor-goods. And anything which contributes to the elasticity of price expectation contributes to instability.⁶³

A second major consideration is the effect of "speculation" in the more restricted sense of speculation in exchange proper. Nobody has ever suggested that speculation would be absent under free exchange conditions, though some have suggested that it would be of little importance.⁶⁴ It seems to be commonly assumed that speculation on the rate of exchange would be of an equilibrating sort--that is, that speculators would try to guess what the "equilibrium" rate ought to be and to anticipate movements toward a rate that would be consistent with the "underlying" factors of prices and incomes. This seems to me to be quite naïve. Speculation thrives on price movements whether these movements are away from or towards an "equilibrium." The speculator is interested in what the market will do, and this, in a market in which speculators are an important element, may for considerable periods have no connection with "underlying" factors, about which most speculators know nothing. Moreover, the so-called underlying factors are themselves influenced by the exchange rate in such a way that it is impossible even in theory for a speculator to know what an "equilibrium" rate (even in a very loose sense) would be without knowing the consequences of his own actions on the market--and if this could be known there would be nothing speculative in taking a position. It is far more likely that the rates of exchange would be subject to immense fluctuations due to speculative activity under any conceivable modern conditions. And to the extent that exchange rates are affected by purchases and sales of a speculative nature,

⁶²Ibid., pp. 212-18. ⁶³Ibid., pp. 227-28.

⁶⁴Graham and Whittlesey, "Fluctuating Exchange Rates, . . .", op. cit., p. 402; Hoffman, op. cit., pp. 222-26.

pressures are put upon the price-income system in the manner previously discussed, and the ability of monetary management to control any prices is impaired.⁶⁵ While it is not possible to weigh the effects of exchange speculation or the effects of the introduction of a consideration of factor-goods at all exactly, it seems impossible to conceive of a strictly free exchange system working at all, much less working satisfactorily, when these considerations are added to those previously suggested.

As a matter of fact, although the writers of the "independent" school have used arguments which depend for their validity on the acceptance of an oversimplified theory of the mechanism under free exchange conditions, very few have actually advocated complete exchange freedom. There is, however, a common belief that some compromise system, allowing exchange rate adjustments to take care of the changes in "underlying" factors--technological changes, changes in the demand for export, and the like--while preventing fluctuation in rates that would, under free exchange conditions, arise from "short-run" disturbances.⁶⁶ This position is very attractive until the question of how such a policy would be administered is raised.

The first problem is a theoretical one. Admitting that the monetary authority ought to iron out short-run fluctuations while allowing the rate of exchange to "seek its own level" with respect to underlying factors, how is the authority to know what the appropriate level is? Evidently the problem is that of determining an equilibrium rate of exchange from observable data. Nobody has ever suggested a satisfactory method for doing this, and, if the matter is carefully examined, it will be seen that there is no such thing as an equilibrium rate of exchange under dynamic conditions even in theory.⁶⁷ An equilibrium exchange rate, like

⁶⁵It is the uncertainty generated by exchange rate fluctuations that gives rise to the chief hindrances to trade under fluctuating exchange conditions. The nature of the difficulty caused by rate fluctuations has been frequently misunderstood. Rate fluctuations impose a cost on the community either in the form of less trade or in the form of costs of maintaining machinery for avoiding the consequences of rate fluctuation during the time lapses which necessarily occur between the making of trade commitments and the subsequent monetary transactions. For a more detailed discussion see ibid., chap. xiii.

⁶⁶See, e. g., Harrod, op. cit., pp. 158-63.

⁶⁷Hoffman, op. cit., pp. 235-40. To mention only one difficulty, the equilibrium rate of theory is different for different time periods.

an equilibrium price of a commodity, is essentially a limit, the concept of which is essential to any systematic economic analysis. It is not a rate which is supposed to be reached in any actual cases, or which could be determined from observable data.

The second problem arises from the fact that, in the face of the difficulty just mentioned, it is impossible for a control authority to be "neutral" with respect to "underlying" factors. Any rate chosen will exert pressures on some parts of the price-income system. One is not entitled to expect that the behavior of national monetary authorities under these circumstances would be motivated much differently than in the past. The pressure for competitive depreciation would undoubtedly be very strong in most countries.⁶⁸ It hardly needs to be stated that competitive depreciation is not a solution to international monetary problems. In practice, however, it is likely that when faced with the problem of determining what the rate of exchange should be most monetary authorities would exhibit great inertia in changing the rate at all. It is much easier to let the rate continue at the current level than to make a decision as to what new level should be sought. Neither competitive depreciation nor arbitrarily pegged rates quite fit the picture of a rate "seeking its natural level" while protected against "short-run" disturbances, but it is hard to anticipate anything else if adherence to some more definite peg, such as a gold standard, is not provided for.⁶⁹ A pegged exchange rate, however, is better than a wildly fluctuating rate only to the extent that people can rely on the peg. The only really satisfactory system is one in which the peg is commonly accepted as being permanent--one over which the discretionary monetary authorities have little or no control.

⁶⁸ Actually, though most administrators believe that depreciation stimulates exports, the experience of the 1930's does not give much support to this belief. Changes in the volume of spendable funds in countries' markets seem to have been more important than changes in the exchange value of currencies. This question is discussed at some length *ibid.*, chap. xii.

⁶⁹ The experience of the 1930's was that when currencies were not rigidly pegged to gold, or to each other, depreciation with respect to gold and with respect to other currencies was the common rule (*ibid.*, p. 251, Fig. 3).

